

Epidemiology of Fractures with Indoor Patients in Bangabandhu Sheikh Mujib Medical College, Faridpur, Bangladesh

Abul Hasan^{1*}, Anadi Ranjan Mondol², Mohammad Shahin Akter³, Masudur Rahman³ and Mohammad Salim Miah³

¹Registrar, Department of Orthopedic Surgery, Bangabandhu Sheikh Mujib Medical College Hospital, Faridpur, Bangladesh

²Associate Professor, Department of Orthopedics, Bangabandhu Sheikh Mujib Medical College (BSMMC), Faridpur, Bangladesh

³Assistant Professor, Department of Orthopedics, Bangabandhu Sheikh Mujib Medical College (BSMMC), Faridpur, Bangladesh

*Corresponding Author: Abul Hasan, Registrar, Department of Orthopedic Surgery, Bangabandhu Sheikh Mujib Medical College Hospital, Faridpur, Bangladesh.

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Abstract

Background: The fractures are secondary trauma. A bone fracture is a medical condition in which there is a partial or complete break in the continuity of the bone. There are many factors causing bone fractures linked to road accidents, industrial accidents, falls from height, etc., which is the first leading cause of death among people aged 18-50. Fractures constitute a significant source of disability, dysfunction, and reduced quality of life, mainly in the elderly population.

Aim of the study: The study aimed to find out the epidemiological characteristics and outcomes of fractures in indoor patients in Bangabandhu Sheikh Mujib Medical College, Faridpur, Bangladesh.

Methods: The study was conducted in Bangabandhu Sheikh Mujib Medical College, Faridpur, Bangladesh, one of the country's highest-volume trauma centers. A total of 4700 patients were obtained from the medical records department from January 2021 to December 2021. Patients were segregated concerning their genders and into three age groups. The etiology of fracture was noted, and fractures were classified according to the anatomical area. Whether the patient received conservative or operative management was also recorded.

Result: This is a retrospective study; a total of 4700 patients were enrolled and analyzed in this study. All 4700 fracture cases admitted in the tertiary hospital meeting the inclusion criteria were evaluated in our research, and the following observations were made from the data collected. The ratio between males and females was 1.4:1. Fractures were classified based on their anatomical location and arranged in decreasing frequency; 890 (18.94%) patients were from the conservative segment, and 3810 (81.06%) patients were from the operative part.

Conclusion: Our study highlights that Bangladeshi epidemiology is unique from our Western counterparts. The population is much younger; older males are affected more than females. Lower limb fractures are more prevalent, and road traffic accidents are responsible for almost half the fractures.

Keywords: Epidemiology; Fractures; Indoor Patients

Introduction

Around the world, trauma is a significant cause of morbidity and mortality. Apart from being a significant economic burden, it is also the leading cause of death and functional disability in young adults [1]. The fractures are secondary trauma. A bone fracture is a medical condition in which there is a partial or complete break in the continuity of the bone. There are many factors causing bone fractures linked to road accidents, industrial accidents, falls from height, etc., which is the first leading cause of death among people aged 18-50. Fractures are a significant source of disability, dysfunction, and reduced quality of life, mostly in the elderly. It leads to high resource demand, mainly due to mortality and dependency. Because our institute is one of the highest-volume trauma centers in the country, has provided state-of-the-art healthcare for nearly a century, and has cases referred to us from across the country, we believe our database is representative of our country's epidemiology. Limited studies on fracture epidemiology have been undertaken in the Bangladeshi population. The study aimed to find out the epidemiological characteristics and outcomes of fractures in indoor patients of Bangladesh.

Methodology and Materials

This is a retrospective, observational study. This study was conducted after approval from the Ethics and Research Committee; data on all patients with fractures from January 2021 to December 2021 was obtained from the medical records department of in Bangabandhu Sheikh Mujib Medical College, Faridpur, Bangladesh. Patients managed on an OPD basis, and skull, face, and rib fractures were excluded from the study. The age and sex of the patients were noted and divided into three age groups – below 18 years, 18-50, and above 50 years. Etiology was classified as vehicular accident, industrial accident, sports injury, fall from height, minor injury, any trauma, or other (weapon injury/assault/crush). Fractures were classified according to anatomical sites commonly recognized by orthopedic surgeons (e.g., proximal humerus/humerus, diaphysis/distal, humerus/clavicle/scapula etc.). Whether patients were managed conservatively or operatively was also noted. For accuracy, the data was cross-checked with ward admission logbooks and operating room registers.

All the data were presented in a suitable table or graph according to their relationship. A description of each table and graph was given to understand them clearly. All statistical analysis was performed using the statistical package for the social science (SPSS) program and Windows. Continuous parameters were expressed as mean \pm SD and categorical parameters as frequency and percentage. The student's t-test made comparisons between groups (continuous parameters). Categorical parameters compared by Chi-Square test. The significance of the results, as determined by a 95.0% confidence interval and a value of $P < 0.05$, was considered statistically significant.

Results

It is a retrospective study; a total of 4700 patients were enrolled and analyzed. All 4700 fracture cases admitted in the tertiary hospital meeting the inclusion criteria were evaluated in our study, and the following observations were made from the data collected. Of the 4700 cases, 2065 (43.94%) fractures occurred in patients aged 18-50 years and 1943 (41.34%) in patients above 50 years, and only 1943 (14.73%) in patients below 18 years (Figure 1). There were 2776 (59.06%) patients who were males, and 1924 (40.94%) were females (Table 1, 2). The ratio between males and females was 1.4:1. The male-to-female ratio was the maximum in the 18-50 age group. Vehicular accidents emerged as the most common mode (M.C) mode of injury-causing fractures making up 2211 (47.06%) of all the cases; the second most common 990 (21.06%) patients fell from height. Low-velocity injuries like falls from standing height, twisting injuries, slipping, etc., were included under Trivial trauma and accounted for 918 (19.53%) fractures. There were 177 (3.76%) patients due to sports injuries, and 116 (2.47%) were due to industrial accidents. Fractures occurring without any history of trauma accounted for 97 (2.06%) of the total, and 191 (4.06%) fractures were attributed to other trauma (Table 3). Fractures were classified based on their anatomical location and arranged in decreasing order of frequency; 890 (18.94%) patients were from the conservative segment, and 3810 (81.06%) patients were from the operative segment (Figure 2).

Discussion

Our study shows that vehicular accidents remain the primary cause of fractures accounting for almost half the cases. The

Anatomical Site	Frequency	Percentage
Proximal Femur	920	19.57
Forearm	495	10.53
Tibia Diaphysis	381	8.11
Distal Radius	326	6.94
Proximal Humerus	283	6.02
Proximal Tibia	250	5.32
Distal Humerus	226	4.81
Femur Diaphysis	221	4.70
Proximal Forearm	193	4.11
Distal Tibia	185	3.94
Humerus Diaphysis	182	3.87
Distal Femur	166	3.53
Ankle	160	3.40
Pelvis	116	2.47
Patella	103	2.19
Cervical Spine	89	1.89
Dorsal Spine	83	1.77
Calcaneum	80	1.70
Lumbar Spine	53	1.13
Clavicle	48	1.02
Scapula	33	0.70
Metatarsal	24	0.51
Carpal	22	0.47
Metacarpal	15	0.32
Phalanx	13	0.28
Sacrum	13	0.28
Toe Phalanx	9	0.19
Talus	6	0.13
Tarsal	5	0.11
Total	4700	100.00

Table 1: Overall fracture distribution of the study population.

Age	Gender	Frequency	Percentage
0 to 18	Male	285	6.06
	Females	409	8.70
18 to 50	Male	1432	30.47
	Females	628	13.36
> 50	Male	1059	22.53
	Females	887	18.87
Total		4700	100

Table 2: Gender distribution based on age.

Model of trauma		
Subject	Frequency	Percentage
Fall from height	990	21.06
Industrial accident	116	2.47
Sports Injury	177	3.76
Trivial Trauma	918	19.53
Vehicular accident	2211	47.06
Other	191	4.06
No Trauma	97	2.06
Total	4700	100

Table 3: Mode of the trauma of the study objects.

Figure 1: Age distribution of the study population.

Figure 2: Management.

distribution of trauma mode found in our study matches those of Indian studies but significantly differs from the Western data, where vehicular accident was not the most common cause [2,3]. At least 6,284 people were killed, and 7,468 others were injured in 5,371 road accidents across Bangladesh in 2021, said a report published by the Road Safety Foundation on Saturday [4]. Bangladesh tops the global list of deaths due to road accidents.

In our study, the highest incidence of fractures was found in the age group of 18-50 years, which is lower than the average age reported in the western literature, where older people are more affected [5]. Vehicle accidents were the most common mode of injury in this age group, highlighting the critical need to control this preventable mode of injury. Comparison with other studies shows a similar male dominance in the 18-50 age group [6]. Although the incidence in women in the age group above 50 increased dramatically in our study, they were still higher than in men compared to studies conducted in the Western world [3]. It may be suggestive that osteoporosis may be associated with elderly females in our country. Our findings on fracture patterns and trauma mode agree with those of the other observers, but there are some differences [7,8]. Since our study only included indoor patients, fractures generally managed on an outpatient basis were found to have a lower prevalence in our study: clavicle, distal radius, ulna, carpals, metacarpals, finger phalanges, ankle, metatarsals, and the phalanges [9-15]. Consequently, fractures of the significant bones like humerus, radius, ulna, spine, pelvis, femur, patella, and tibia, which require hospitalization, were found to have a higher prevalence in our study [16-22]. The prevalence of scapula, tarsus, and proximal humerus fractures paralleled the prevalence in Western studies [23-25].

Limitations of the study

The study was conducted in a single hospital with a small sample size. So, the results may not represent the whole community.

Conclusion and Recommendations

The distribution of fracture patterns in our study will help institutions allocate resources in the emergency rooms like beds, splints, braces, surgical implants, etc. The results of this study highlight the burden of road accidents. Bangladesh's governments have implemented measures against drunk driving, set speed limits, implemented fines, and have worked to provide safer roads, yet the expected results are not to be seen. The age group, 18-50, are the most common victims of accidents. Since this is the working population, economic output is also affected apart from the government expenditure on treatment.

Funding

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Conflict of Interest

None declared.

Ethical Approval

The study was approved by the Institutional Ethics Committee.

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